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# UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

*(Only for new nonprovisional applications under 37 CFR 1.53(b))*

Docket No.  
YOR9-2000-0713US1

Total Pages in this Submission

**TO THE ASSISTANT COMMISSIONER FOR PATENTS**

Box Patent Application

Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**METHOD AND VISUAL INTERFACE FOR EVALUATING MULTI-ATTRIBUTE BIDS IN A NETWORK ENVIRONMENT**

and invented by:

**Ho Soo Lee and Juhnyoung Lee**

11/28/00  
U.S. PRO  
JCS03  
09/723236

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

Continuation    Divisional    Continuation-in-part (CIP)   of prior application No.: \_\_\_\_\_

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Which is a:

Continuation    Divisional    Continuation-in-part (CIP)   of prior application No.: \_\_\_\_\_

Enclosed are:

**Application Elements**

1.  Filing fee as calculated and transmitted as described below
  
2.  Specification having 22 pages and including the following:
  - a.  Descriptive Title of the Invention
  - b.  Cross References to Related Applications (*if applicable*)
  - c.  Statement Regarding Federally-sponsored Research/Development (*if applicable*)
  - d.  Reference to Microfiche Appendix (*if applicable*)
  - e.  Background of the Invention
  - f.  Brief Summary of the Invention
  - g.  Brief Description of the Drawings (*if drawings filed*)
  - h.  Detailed Description
  - i.  Claim(s) as Classified Below
  - j.  Abstract of the Disclosure

**UTILITY PATENT APPLICATION TRANSMITTAL  
(Large Entity)**

*(Only for new nonprovisional applications under 37 CFR 1.53(b))*

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**Application Elements (Continued)**

3.  Drawing(s) (*when necessary as prescribed by 35 USC 113*)
  - a.  Formal Number of Sheets \_\_\_\_\_
  - b.  Informal Number of Sheets 8
4.  Oath or Declaration
  - a.  Newly executed (*original or copy*)  Unexecuted
  - b.  Copy from a prior application (37 CFR 1.63(d)) (*for continuation/divisional application only*)
  - c.  With Power of Attorney  Without Power of Attorney
  - d.  DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5.  Incorporation By Reference (*usable if Box 4b is checked*)  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6.  Computer Program in Microfiche (*Appendix*)
7.  Nucleotide and/or Amino Acid Sequence Submission (*if applicable, all must be included*)
  - a.  Paper Copy
  - b.  Computer Readable Copy (*identical to computer copy*)
  - c.  Statement Verifying Identical Paper and Computer Readable Copy

**Accompanying Application Parts**

8.  Assignment Papers (*cover sheet & document(s)*)
9.  37 CFR 3.73(B) Statement (*when there is an assignee*)
10.  English Translation Document (*if applicable*)
11.  Information Disclosure Statement/PTO-1449  Copies of IDS Citations
12.  Preliminary Amendment
13.  Acknowledgment postcard
14.  Certificate of Mailing

First Class     Express Mail (*Specify Label No.*): \_\_\_\_\_

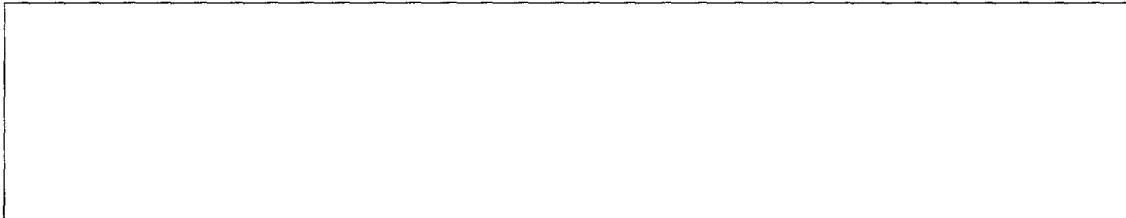
**UTILITY PATENT APPLICATION TRANSMITTAL**  
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Docket No.  
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**Accompanying Application Parts (Continued)**

15.  Certified Copy of Priority Document(s) (*if foreign priority is claimed*)
16.  Additional Enclosures (*please identify below*):  


**Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)**

17.  Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

***Warning***

***An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.***

**UTILITY PATENT APPLICATION TRANSMITTAL**  
**(Large Entity)**

*(Only for new nonprovisional applications under 37 CFR 1.53(b))*

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**Fee Calculation and Transmittal**

**CLAIMS AS FILED**

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	31	- 20 =	11	x \$18.00	\$198.00
Indep. Claims	3	- 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable)	<input type="checkbox"/>				\$0.00
				<b>BASIC FEE</b>	<b>\$710.00</b>
OTHER FEE (specify purpose)					\$0.00
				<b>TOTAL FILING FEE</b>	<b>\$908.00</b>

A check in the amount of \_\_\_\_\_ to cover the filing fee is enclosed.

The Commissioner is hereby authorized to charge and credit Deposit Account No. **50-0510** as described below. A duplicate copy of this sheet is enclosed.

- Charge the amount of **\$908.00** as filing fee.
- Credit any overpayment.
- Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).



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APPLICATION  
FOR  
UNITED STATES  
LETTERS PATENT

Applicants: Ho Soo Lee and Juhnyoung Lee  
For: METHOD AND VISUAL INTERFACE FOR  
EVALUATING MULTI-ATTRIBUTE BIDS IN A  
NETWORK ENVIRONMENT  
Docket No.: YOR9-2000-0713US1

**METHOD AND VISUAL INTERFACE  
FOR EVALUATING MULTI-ATTRIBUTE  
BIDS IN A NETWORK ENVIRONMENT**

5

**DESCRIPTION**

**BACKGROUND OF THE INVENTION**

*Field of the Invention*

10

The present invention generally relates to on-line purchasing of products or services over a computer network and, more particularly, to a method for purchasing and selling products or services in a networked environment using a request for quotation process and a visual interface for evaluating submitted bids for such products or services.

15

*Background Description*

20

Commerce over networks, particularly electronic commerce (e-commerce) over the Internet, has increased significantly over the past few years. In e-commerce models, buyers and sellers make trades, e.g., buy and sell services or products, over the World Wide Web portion of the Internet. In one example, one or more web pages, typically referred to as an electronic marketplace (e-marketplace), provide one or more different forms of trading mechanisms including auctions, reverse auctions, and exchanges. In an auction, one seller receives bids from one or more buyers for one or more products before making a transaction. In contrast, a reverse auction allows one buyer to receive bids from one or more potential sellers. In an exchange, multiple buyers and multiple sellers submit asks and bids, respectively, to a marketplace. The marketplace then makes matches

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USPTO Patent Application Disclosure

between the asks and bids of the buyers and sellers either continuously or periodically.

It is known, of course, that these trading models have many different variations. These auction variations may include English (buyers call ascending prices), Dutch (market manager calls descending prices to obtain buy bids), Japanese (market manager calls ascending prices to obtain buy bids), and sealed bid (buyers place sealed bids) auctions. In still other variations of auctions, there is an open Request for Bids and a sealed Request For Bids. In the open Request for Bids, buyers may call ascending prices and a seller manually selects the winning price. In the sealed Request for Bids buyers submit sealed bids and a seller manually selects the winning bid.

There are also variations on reverse auctions which include reverse English (sellers call descending prices), reverse Dutch (market manager call ascending prices to obtain sell bids), reverse Japanese (market manager calls descending prices to obtain sell bids), and reverse sealed bid (sellers place sealed bids) auctions. Reverse auctions further include open Request For Quotes and sealed Request For Quotes. In the open Request for Quotes, the sellers call descending prices and a buyer manually selects a winning price, and in the sealed Request for Quotes the sellers submit sealed bids and a buyer manually selects the winning quote.

Exchanges also include variations. These variations include continuously clearing exchanges and periodically clearing exchanges.

The Request for Quotation (RFQ) is used often in the e-marketplace. In this type of environment, a request is submitted by a buyer to an e-marketplace to invite potential sellers to bid on specific products or services needed by the buyer. The RFQ process is useful in all markets that depend upon attributes other than price such as delivery time, quantity discounts and the like. In these RFQ processes, the buyers are permitted to manually select one or more bids from sellers after examining and comparing submitted sell bids. In this manner, the RFQ process allows the sellers to match exactly the buyers' requirements (including the attributes of price, delivery time and the like) thus leading to a

strong rate of return and high satisfaction ratings.

In RFQ processes, it is currently known that certain computer tools may be used to assist the buyers in evaluating and comparing the submitted sell bids. One example is the scoring function of Perfect.com's™ RFQ engine. This tool allows a buyer, when submitting an RFQ, to specify the subjective importance of relevant factors of products or services such as quantity, material quality, product quality ratings, merchant reputation, warranty, support, delivery time, delivery cost as well as price and other features. Once the bids are received from the sellers, the RFQ engine filters the sell bids by using the buyer's criteria, calculates the scores of individual bids by using the buyer's profile and a scoring function, and ranks such bids by score. The buyer, when presented with the filtered sell bids with associated ranks, may then select a winning bid. The use of bid ranking by score of individual sell bids assists the buyer in selecting the winning bids without having to analyze and evaluate lengthy unstructured text documents describing product attributes and other factors relevant to the purchase.

However, systems such as the Perfect.com™ RFQ engine may oversimplify the bid selection process for buyers in some cases. Thus, this type of system may not accurately reflect the bids such that the buyers may misjudge submitted bids or need to examine lengthy unstructured text description on product or service attributes to understand and confirm the bid ranking. This can be a time consuming and tedious task.

By way of another example, Figure 1 shows a flow chart of a RFQ process using a conventional system. In Figure 1, a buyer submits an RFQ for one or more products or services with a set of attribute preference to an e-marketplace (step 100). The attribute preference may include product attributes and other relevant factors such as price, quantity, material quality, product quality ratings, merchant reputation, warranty, support, delivery time, and delivery cost. The attribute preference submitted by the buyer will be used later for evaluating received sell bids by the market maker (Figure 2). Also, the buyer is allowed to specify a criterion for the termination of the RFQ typically in a form of

time and date for termination. To help buyers specify all this information about an RFQ and also to automate the matching process of an RFQ and submitted sell bids, the market maker of the e-marketplace may provide a structured form (as one or more Web pages) for all the data entries. The market maker may also store the submitted information about  
5 the RFQ in a database system of the e-marketplace.

In step 105, the submitted RFQ is posted on the e-marketplace for a time period specified by the buyer. The attribute preference of the RFQ may or may not be revealed to potential sellers in the e-marketplace depending on the market type. In  
10 step 110, one or more sellers respond to the RFQ by submitting bids to the e-marketplace. The sellers may, at this step, specify various relevant factors in the bids including price, quantity, etc. To assist the sellers, the market maker of the e-marketplace may provide a structured form (as one or more Web pages) for all the data entries, and may also automate the matching process of an RFQ and submitted  
15 bids. The market maker may store the information about the submitted sell bids in the database system in step 115.

When the RFQ is terminated by the criterion specified by the buyer, the market maker, in step 120, processes the newly submitted sell bids before presenting the sell bids to the buyer. This processing may include, for example, filtering out bids that do not meet any one or more of the attribute preferences. The market maker may also  
20 rank and sort the sell bids by a score that is calculated by using one or more scoring algorithms. In an alternative approach, the buyer may simply retrieve the RFQ and sell bids from the database system and examine the bids manually.

In step 125, the list of the processed sell bids is presented to the buyer. In step  
130, the buyer then examines the sell bids in the list, and then evaluates the sell bids in  
25 order to select one that most meets the buyer's needs. Optionally, in step 135, the buyer can request more information about one or more of the sell bids in the list. To help provide this information, the market maker may provide one or more hyper-links

for each bid to Web pages that provide more information about the sell bid. In addition, the buyer may request more information which is not readily available, in which the market maker may provide contact information including phone number, fax number, and/or an email address of sellers in the sell bid list. After finishing the evaluation of sell bids, in step 140, the buyer selects one or more sell bids from the given list. Finally, in step 145, the buyer purchases products or services from the selected sell bids.

Figure 2 is an example of a list of sell bids ranked by score using the conventional system of Figure 1. The list 200 may show, for example, rank 202, score 203, bid name 204, seller name 205, price 206, an information button 207 and a buy button 208. The list 200 may also show sell bids 209, 210 and 211 ranked by score. The bid names 204 as well as information buttons 207 may be hyper-links to Web pages. The hyper-links to the information pages may provide detailed information of individual bids in an unstructured text format.

Values of each of these relevant factors along with the importance value or "weight" of each factor specified by the buyer of the RFQ are used to calculate the score of individual bids. When the market maker processes submitted sell bids and presents the list 200 to the buyer, the buyer is capable of examining different sell bids by comparing ranks 202 and scores 203 and reading attribute information in web pages reachable from the information buttons 207. When the buyer selects one or more bids from the list 200 after examination, the buyer may then purchase the products or services simply by clicking on the buy buttons 208 and providing payment information.

A problem with the conventional method of Figures 1 and 2 is that representing multiple attribute values of products or services with a single number may hide important information useful for bid selection from buyers. For example, it is impossible to distinguish non-dominated bids from dominated bids by simply

evaluating the score values of sell bids. (A bid (Bid “A”) is dominated by another bid (Bid “B”) if the value of each attribute of Bid “A” is not better than that of each corresponding attribute of Bid “B”.)

Another problem with the conventional method is that it is arbitrary and often  
5 extremely difficult for buyers to correctly and effectively assign importance value or  
“weight” to different attributes of a product or service. This fact is especially true  
when the buyer is not given any information about the algorithm of the scoring  
function, i.e., how the scoring function uses the weights of different attributes to  
generate a single score for different bids. In this manner, the score may be arbitrarily  
10 assigned or in an unintended way.

Yet another problem with the weight assignment is that it is impossible to  
express relationships among different attributes. For example, a buyer may have a  
tradeoff relationship between price and delivery time of a product; namely, the buyer  
may be willing to pay more for a product or service if the product or service can be  
delivered within a short period of time. However, it is not sufficient to express this  
15 kind of relationship among two attributes with an assignment of single weight value to  
each attribute.

## **SUMMARY OF THE INVENTION**

An object of the present invention is to provide a method for evaluating RFQ processes over a network.

5 An object of the present invention is to provide a method for evaluating submitted sell bids having two or more attributes over a network.

An object of the present invention is to provide a method for evaluating submitted sell bids having two or more attributes while not requiring any assignment of weights to individual product or service attributes.

10 An object of the present invention is to provide a method for filtering attributes associated with sell bids having two or more attributes.

An object of the present invention is to provide a method for filtering dominated bids.

15 An object of the present invention is to provide a visual interface for buyers of Request for Quotation (RFQ) processes over a network.

An object of the present invention is to provide a visual interface which shows all the attributes values of the product or service in a single screen.

An object of the present invention is to provide a visual interface having a set of filters which can be dynamically customized by business rules.

20 An object of the present invention is to provide a visual interface which allows a buyer to select or deselect filters in order to compare different sell bids under different conditions.

25 In order to accomplish the objectives of the present invention, a buyer submits a Request for Quotation (RFQ) over a network. With the RFQ, the buyer may also provide one or more business rules as part of an attribute preference set. A market maker uses the business rules to create a visual interface augmented by customized filters which are later used to evaluate seller submitted bids. The submitted RFQ is

posted on the e-marketplace so that one or more sellers can submit one or more bids with attribute values in response thereto. The bids are received in the e-marketplace, at which time the e-marketplace can arrange, sort or filter the received bids in order to assist the buyer in examining and evaluating such bids. The filtering may include  
5 filtering an attribute value, an attribute line, a bid line or a portion of the bid line. The bids, in conjunction with the business rules and attribute values, are then used by the e-marketplace to creates a visual interface customized for individual RFQs showing all the attributes of the RFQ and related attribute values of individual sell bids in a single screen.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

5       Figure 1 is a flow chart of a conventional Request for Quotation (RFQ) process;

Figure 2 is a conventional list of sell bids ranked by score;

10      Figure 3 is a block diagram of a system architecture of an electronic marketplace used with the method of the present invention;

Figure 4 is a flow chart of a RFQ process of the present invention;

15      Figure 5 is a visual interface of sell bids using the method of the present invention;

Figure 6 is a visual interface of sell bids with a filtered dominated sell bid of the present invention;

15      Figure 7 is a visual interface of sell bids with a filtered attribute of the present invention; and

Figure 8 is a visual interface which filters sell bids by using a business rule of the present invention.

**DETAILED DESCRIPTION OF A PREFERRED  
EMBODIMENT OF THE INVENTION**

Referring now to the drawings and more particularly to Figure 3, a block diagram of the system architecture of an e-marketplace is provided. In Figure 3, the architecture of the e-marketplace includes one or more buyers 310 accessing Web browser programs 312 via one or more computers 314. The buyers 310 submit Request for Quotations (RFQ) 316 (and accompanying attributes as discussed with reference to Figure 4) via the web browser programs 312 over a network 318 to an e-marketplace 320 preferably implemented by a web server 322. The web server 322 stores the RFQ 316 as well as other information such as, for example, product catalogs, seller and buyer information and the like in a database system 324. A market maker 326 may operate the e-marketplace 320 via a computer 330. Once the RFQ 316 is submitted, the e-marketplace 320 will post the RFQ 316 as a new market on the web server 322.

One or more sellers 326 may access the e-marketplace 320 over the network 318 via a web browser program 328 residing on a seller computer 330. The web browser programs 312 and 328 of both the buyer 310 and the seller 326, respectively, as well as the web server 322 preferably use HyperText Transfer Protocol (HTTP).

The sellers 326 may find and access the posted RFQ 316 via the web browser program 328, and thereafter submit one or more sell bids 332 having attribute values to the e-marketplace 322 via the network 318. The sell bid 332 and associated attribute values may be stored in the database 324 as well as transmitted to the buyer's web browser 312 over the network 318. Also, the web pages associated with both of the web browser programs 312 and 330 may provide a structured form for entering the appropriate information such as, for example, the RFQ and the submitted bids.

Figure 4 is a flow chart showing the method of the present invention

implemented using the system architecture of Figure 3. It should be understood by those of skill in the art that the e-marketplace as well as the other components of Figure 3 are adapted to implement the steps of Figure 4. Also, Figure 4 can equally represent a high level block diagram capable of implementing the steps provided therein.

In general, the method of the present invention allows the buyer 310 to provide one or more business rules (conditions) as part of an attribute preference set. The market maker 326 can use these attributes to create a visual interface customized for individual RFQs showing all the attributes of the RFQ. The business rules may also be augmented in the visual interface in a form of dynamic filters. The buyer 310 can then interactively select or de-select the filters in order to change the display in an effort to compare sell bids 332 having different attribute values. The filtering may include filtering an attribute value, an attribute line associated with an attribute, a bid line (representing connected attribute values for a single bid) or a portion of the bid line.

More specifically, in step 405, the buyer 310 submits one or more business rules to the e-marketplace 320 as part of an attribute preference set which describes the buyer preferences for various relevant factors. The one or more business rules specify one or more constraints on one or more attributes of the product or service. The various factors (i.e., attributes) important to the buyer may include, but are not limited to, price, quantity, volume discount policy, material quality, product quality ratings, merchant reputation, warranty, support, delivery time, delivery cost and other factors.

The business rules of step 405 may also express various relationships among attributes of products or services. By way of specific example, the buyer 310 may have a business rule describing that the buyer is willing to pay more for a product if a seller can deliver the product of interest overnight while other conditions remain the

same. This particular business rule specifies a relationship between price and delivery time. These and other business rules will be used by the market maker 326 to create a visual interface augmented by customized filters of the business rules which are later used to evaluate bids. The customized filters may filter an attribute value, an attribute line (associated with a buyer attribute), a bid line (representing connected attribute values submitted by the seller) or a portion of the bid line.

In step 410, the submitted RFQ is posted on the e-marketplace 320 for a time period specified by the buyer 310. In step 415, one or more sellers 326 submit one or more bids 332 for the RFQ in the e-marketplace 320. The submitted bids may also be accompanied by attribute values associated with attributes of the buyer, and which are later used by the buyer to determine an appropriate bid. In step 420, the e-marketplace 320 receives the bids 332 and attribute values) and stores such bids 332 and attribute values in the database 324. In step 425, the e-marketplace 320 may arrange, sort or filter the received bids 332 in order to assist the buyer 310 in examining and evaluating such bids 332.

In step 430, the market maker 326 of the e-marketplace 320 creates a visual interface customized for individual RFQs showing all the attributes of the RFQ and related attribute values of individual sell bids 332 in a single screen by using a parallel coordinate system. Figures 5-8 show several interfaces implemented by the present invention which have the attributes and attribute values for evaluation by the buyer. The business rules specified by the buyer 310 at step 405 are also augmented in the visual interface in a form of dynamic filters. These filters may be implemented using sorting-key algorithms, as discussed below.

In step 435, the buyer 310 interactively selects or de-selects filters representing one or more business rules in order to change the display of the given parallel coordinate-based visual interface. The changes in the display be include a reordering of the attributes or attribute values. This allows the buyer 320 to compare the sell bids

332 having different attribute values, thus determining the most desirable bid.

In step 440, the buyer may optionally request more information about one or more of the sell bids. After finishing the evaluation of sell bids, in step 445, the buyer selects one or more sell bids from the given list. Finally, in step 450, the buyer purchases products or services from the selected sell bids.

Figure 5 shows a visual interface of sell bids implemented using the method of the present invention. In Figure 5, a display of sell bids 332 with a visual interface showing the RFQ number 501 that identifies a specific buyer RFQ is provided. A Cartesian coordinate system having an x-axis 502 shows one or more attributes 503, 504, 505 and 506 specified by the buyer 310 in the attribute preference set at the RFQ submission step 405 of Figure 4. An example of attributes displayed on the x-axis 502 include price, quantity, material quality, product quality ratings, merchant reputation, warranty, support, delivery time, and delivery cost. Note that each attribute on the x-axis 502 is preferably represented by a equally-distanced separate line parallel (known as an attribute line) to the y-axis 501.

Still referring to Figure 5, a y-axis 501 shows one or more attribute values of bids submitted by the sellers 326. Each attribute value of a bid is marked on the attribute line, and the attribute values of a bid 332 on the attribute lines are connected by a line. These lines represent a sell bid and are preferably referred to as a sell bid line as represented by reference numerals 507, 508, and 509. The sell bid lines 507, 508 and 509 may correspond to the bids 209, 210 and 211 of Figure 2. Finally, the visual interface shows a filter 510 which allows the buyer to dynamically remove dominated bids from the interface and examine only non-dominated sell bids in the interface. In the example of Figure 5, non-dominated bids (as represented by bid 2) are shown.

As should now be obvious to those of skill in the art, the visual interface of Figure 5 is capable of showing all of the attributes interesting to the buyer and all of

the corresponding attribute values of submitted sell bids in a single screen. This allows the buyer to effectively examine all of the relevant information and visually compare two or more sell bids by the displayed shape in the interface. Also, the method and use of the interface of the present invention provides the buyer with a set 5 of filters based on the business rules specified by the buyer. These filters allow the buyer to interactively select or de-select one or more filters to effectively and visually compare sell bids having different attribute values.

Figure 6 shows a visual interface having filtered dominated bids. The dominated bids can be determined by using a standard multi-key sorting algorithm. That is, using a standard multi-key sorting algorithm, bids are sorted by multiple keys (i.e., multiple attribute values of bids). A bid is dominated by another bid if every key 10 of the dominated bid is less than the corresponding key of the dominating bid in the result of the multi-key sorting.

More specifically, Figure 6 shows a filter button 510 which allows the buyer to filter non-dominated bids. In the example of Figure 6, bid 2 (of Figure 5) is filtered and is thus not shown in the visual interface. (Bid 2 is dominated by bid 3 because the value of each attribute of bid 2 is “worse” or less than that of each corresponding attribute of the dominating bid 3.) In general, dominated bids need not be considered 15 in the bid selection process by the buyer because dominated bids (e.g., bid 2) are fully represented by the dominating bids (e.g., bid 3). The buyer, however, may still determine related information such as how many dominated bids are submitted for the RFQ, and which sellers submit dominated or non-dominated sell bids.

Figure 7 is a visual interface with a filtered attribute. As shown in Figure 7, the filtering capability of the present invention is not limited to filtering of dominated 20 and non-dominated bids, but may also be used to filter individual attributes. This can be accomplished by augmenting each attribute in the interface with a select/de-select button 503a, 504a, 505a and 506a. In the case of Figure 7, attribute A4 (button 506a)

is deselected and the attribute values of displayed bids for A4 are thus removed from the display. By using filters associated with individual attributes, the buyer can dynamically create different conditions and compare sell bids under different environments.

5 An additional feature that can be augmented by attributes is a reordering operation. With this operation along with attribute filters, the buyer can arrange the order of attribute lines displayed in the interface. This allows the buyer to visually detect the changes in the sell bid lines thus being able to compare sell bids under diverse circumstances. Furthermore, each attribute can be augmented by a range 10 adjust operation. This operation allows the buyer to adjust the range of attribute values of interest and filter out sell bids which have one or more attribute values that do not fall within a desired range.

15 Figure 8 is a visual interface which filters sell bids by using a business rule. To generate this display, the market maker of the e-marketplace generates one or more filters 511 based on the business rules specified by the buyer in the RFQ submission step 405 of Figure 4. By allowing the buyer to interactively select or de-select one or more business rule-based filters, the interface provides related information regarding the effect of the business rules, e.g., how many sell bids are affected by a specific 20 business rule, which sellers are affected by the business rule and the like. In the example of Figure 8, the buyer selected a business rule that described a requirement on an attribute value which was not met by one bid, bid 2. Thus, bid 2 is removed from the visual interface.

25 While the invention has been described in terms of preferred embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the appended claims.

**CLAIMS**

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

- 1        1. A method of purchasing products and services over a network comprising the steps  
2        of:
  - 3                submitting a Request for Quotation (RFQ) with at least one attribute over the  
4                network;
  - 5                receiving at least one bid in response to the RFQ over the network, each of the  
6                at least one bid having at least one attribute value associated therewith; and  
7                creating a graphical visual interface based on a Cartesian coordinate system,  
8                the graphical user interface showing a relationship in a graphical format between the at  
9                least one attribute and the at least one bid and associated attribute value in a single  
10          display.
- 1        2. The method of claim 1, further comprising the steps of:
  - 2                providing a form for entering the RFQ and at least one attribute; and  
3                providing a form for entering the least one bid and attribute value.
- 1        3. The method of claim 2, further comprising the step of submitting the RFQ form  
2        and the bid form over the network to a web server.
- 1        4. The method of claim 3, wherein the RFQ form and the bid form are web pages  
2        which allow a buyer and a seller to input one or more data values for one or more data  
3        categories.

1       5. The method of claim 4, wherein the data categories include the at least one  
2       attribute, the at least one attribute value or a business condition submitted with the at  
3       least one RFQ.

1       6. The method of claim 1, wherein the at least one attribute value is one of price,  
2       quantity, volume discount policy, material quality, product quality ratings, merchant  
3       reputation, warranty, support, tax, delivery time, and delivery cost.

1       7. The method of claim 1, further comprising the step of storing the RFQ and the at  
2       least one RFQ attribute and the at least one bid and attribute value in a database.

1       8. The method of claim 1, further comprising the step of providing business  
2       conditions with the RFQ, the business conditions being one or more constraints for  
3       values associated with the at least one attribute.

1       9. The method of claim 8, wherein the business conditions further include one or  
2       more relationships among the at least one attribute value and the at least one RFQ  
3       attribute.

1       10. The method of claim 8, further comprising the steps of:  
2              providing at least one bid line representative of connected attribute values  
3              displayed on the graphical visual interface and responsive to the business conditions;  
4              filtering the business conditions in order to eliminate one of the at least one bid  
5              line which does not meet one or more of the business conditions.

1       11. The method of claim 1, further comprising the step of providing at least two  
2       attribute lines and one bid line, wherein:

3           each of the attribute lines represents respectively one of the at least one  
4           attribute, the attribute lines are parallel and equally-spaced; and  
5           the one bid line represents connected attribute values positioned on the each of  
6           the attribute lines and associated with a bid of the at least one bid.

1       12. The method of claim 11, further comprising the step of filtering out an attribute  
2       line of the attribute lines or the one bid line from the graphical visual interface.

1       13. The method of claim 11, further comprising the step of filtering out a portion of  
2       the one bid line from the graphical visual interface.

1       14. The method of claim 1, further comprising the step of filtering out an attribute  
2       value of the least one attribute value from the graphical visual interface.

1       15. The method of claim 1, further comprising the step of filtering out dominated bids  
2       associated with the at least one bid from the graphical visual interface.

1       16. The method of claim 15, wherein the dominated bids have one or more attributes  
2       each having a value not exceeding a value of a corresponding attribute of another bid.

1       17. The method of claim 1, further comprising an attribute line reordering operation  
2       and an attribute value range adjust operation associated with the at least one RFQ  
3       attribute and the attribute value.

1       18. The method of claim 17, wherein the attribute line reordering operation changes  
2       an order of attribute lines associated with the at least one attribute.

1       19. The method of claim 18, wherein the attribute value range adjust operation  
2       changes a range of attribute values associated with the at least one attribute value.

1       20. A system for purchasing products and services over a network comprising:  
2           means for submitting a Request for Quotation (RFQ) with at least one attribute  
3           over the network;  
4           means for receiving at least one bid in response to the RFQ over the network,  
5           each of the at least one bid having at least one attribute value; and  
6           means for creating a graphical visual interface based on a Cartesian coordinate  
7           system showing a relationship in a graphical format between the at least one attribute  
8           and corresponding attribute value in a single display.

1       21. The system of claim 20, further comprising means for filtering from the graphical  
2       visual interface one of the at least one attribute value and the RFQ value.

1       22. The system of claim 20, further comprising:  
2           means for providing at least one bid line representative of connected attribute  
3           values displayed on the graphical visual interface;  
4           means for filtering at least one of the bid line or a portion thereof.

1       23. The system of claim 22, further comprising means for providing attribute lines  
2       representative of the at least one RFQ attribute.

1       24. The system of claim 23, further comprising:  
2           means for placing attribute values associated with the submitted bid on  
3           respective attribute lines; and  
4           means for providing a bid line spanning between the attribute lines, the bid line

5 connecting the attribute values located on the respective attribute lines.

1 25. The system of claim 24, further comprising:

2 means for reordering the attribute lines; and

3 means for adjusting an attribute value range associated with the at least one  
4 attribute.

1 26. A machine readable medium containing code for purchasing products and services  
2 over a network, the code implementing the steps of:

3 submitting a Request for Quotation (RFQ) with at least one attribute over the  
4 network;

5 receiving at least one bid in response to the RFQ over the network, each of the  
6 at least one bid having at least one attribute value; and

7 creating a graphical visual interface based on a Cartesian coordinate system,  
8 the graphical user interface showing a relationship in a graphical format between the at  
9 least one attribute and the at least one bid and associated attribute value in a single  
10 display.

1 27. The machine readable code of claim 26, further comprising the step of filtering  
2 from the graphical visual interface one of the at least attribute value and the RFQ  
3 attribute.

1 28. The machine readable code of claim 26, further comprising the step of providing  
2 at least one bid line representative of connected attribute values of the at least one  
3 attribute value.

1 29. The machine readable code of claim 26, further comprising the step of providing

2 attribute lines representative of the at least one RFQ attribute.

1 30 The machine readable code of claim 29, further comprising the steps of:

2 placing attribute values associated with the submitted bid on respective attribute lines;

3 and

4 providing a bid line spanning between the attribute lines, the bid line

5 connecting the attribute values located on the respective attribute lines.

1 31. The machine readable code of claim 30, further comprising the steps of :

2 reordering the attribute lines; and

3 adjusting an attribute value range associated with the at least one attribute

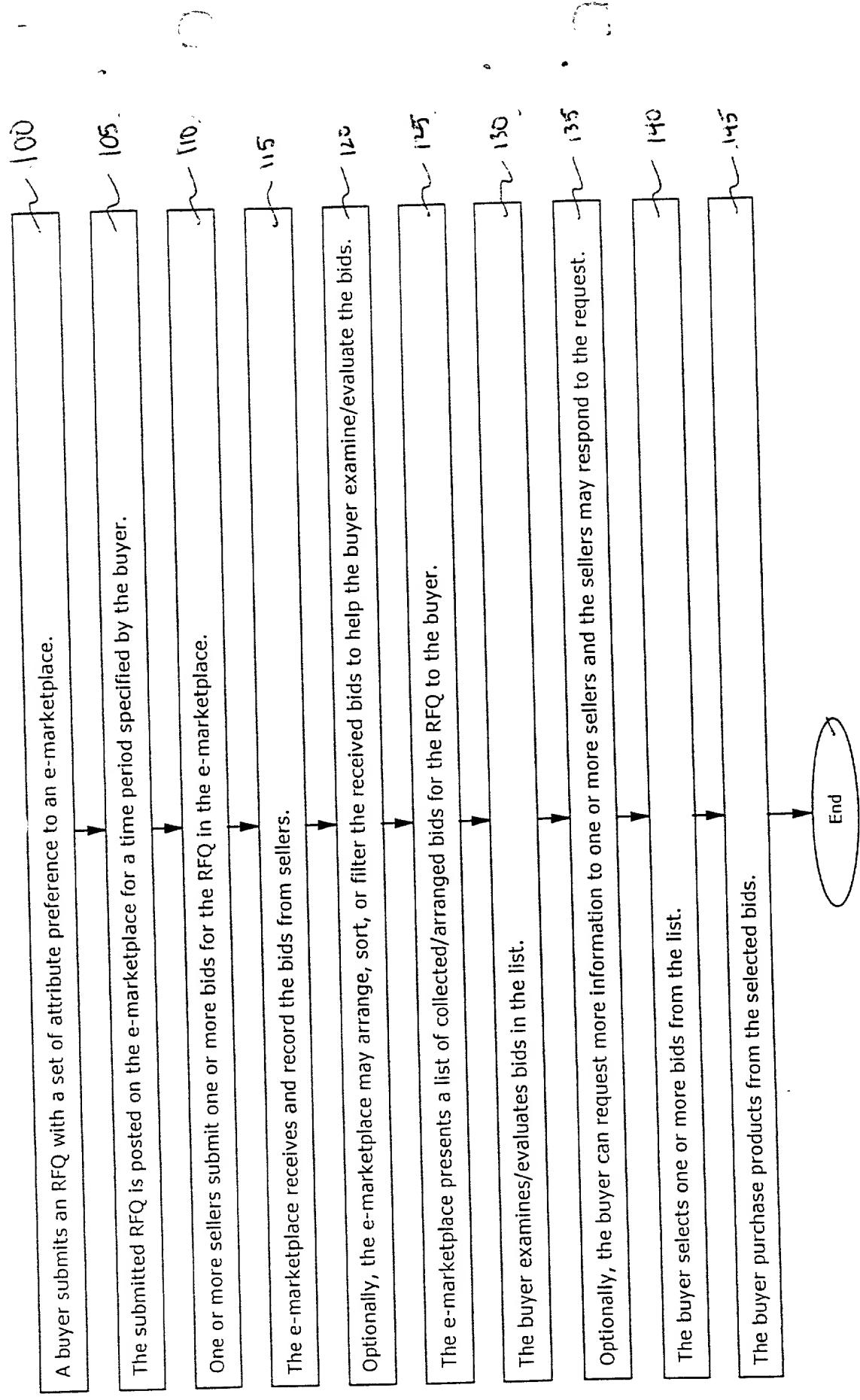
4 value.

**METHOD AND VISUAL INTERFACE  
FOR EVALUATING MULTI-ATTRIBUTE  
BIDS IN A NETWORK ENVIRONMENT**

**ABSTRACT OF THE DISCLOSURE**

5           A method for purchasing and selling products or services in a networked environment using a request for quotation process and a visual interface for evaluating submitted bids for such products or services. A buyer submits a Request for Quotation (RFQ) and associated attributes and/or business rules over a network. As seller responds to the RFQ by submitting a bid with attribute values. A market maker 10 uses the buyer attributes and/or business rules with the attribute values of the submitted bid to create a visual interface augmented by customized filters which are later used to evaluate seller submitted bids. The bids are received in the e-marketplace, at which time the e-marketplace can arrange, sort or filter the received bids in order to assist the buyer in examining and evaluating such bids. The filtering may include filtering an attribute value, an attribute line, a bid line or a portion of the 15 bid line.

DRAFT EDITION



**Figure: 1 PRIOR-ART**

Figure: 2 PRIOR ART

RFQ number: 1097

Rank	Score	Bid name	Seller	Price (\$)	Information button	Buy button
1	97	<u>Bid 1</u>	Seller A	203.00		
2	94	<u>Bid 2</u>	Seller B	206.00		
3	91	<u>Bid 3</u>	Seller B	208.00		

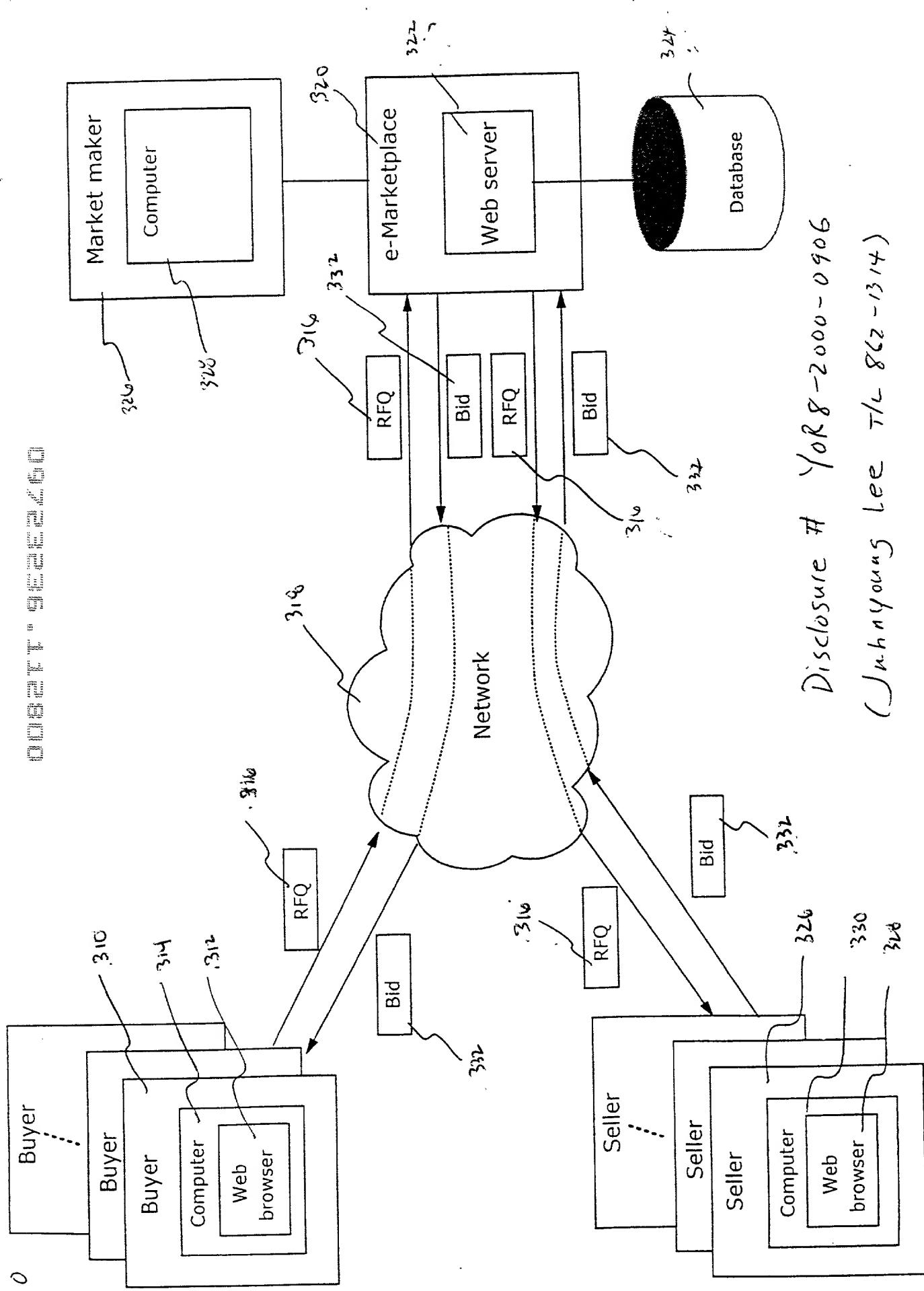


Figure: 3

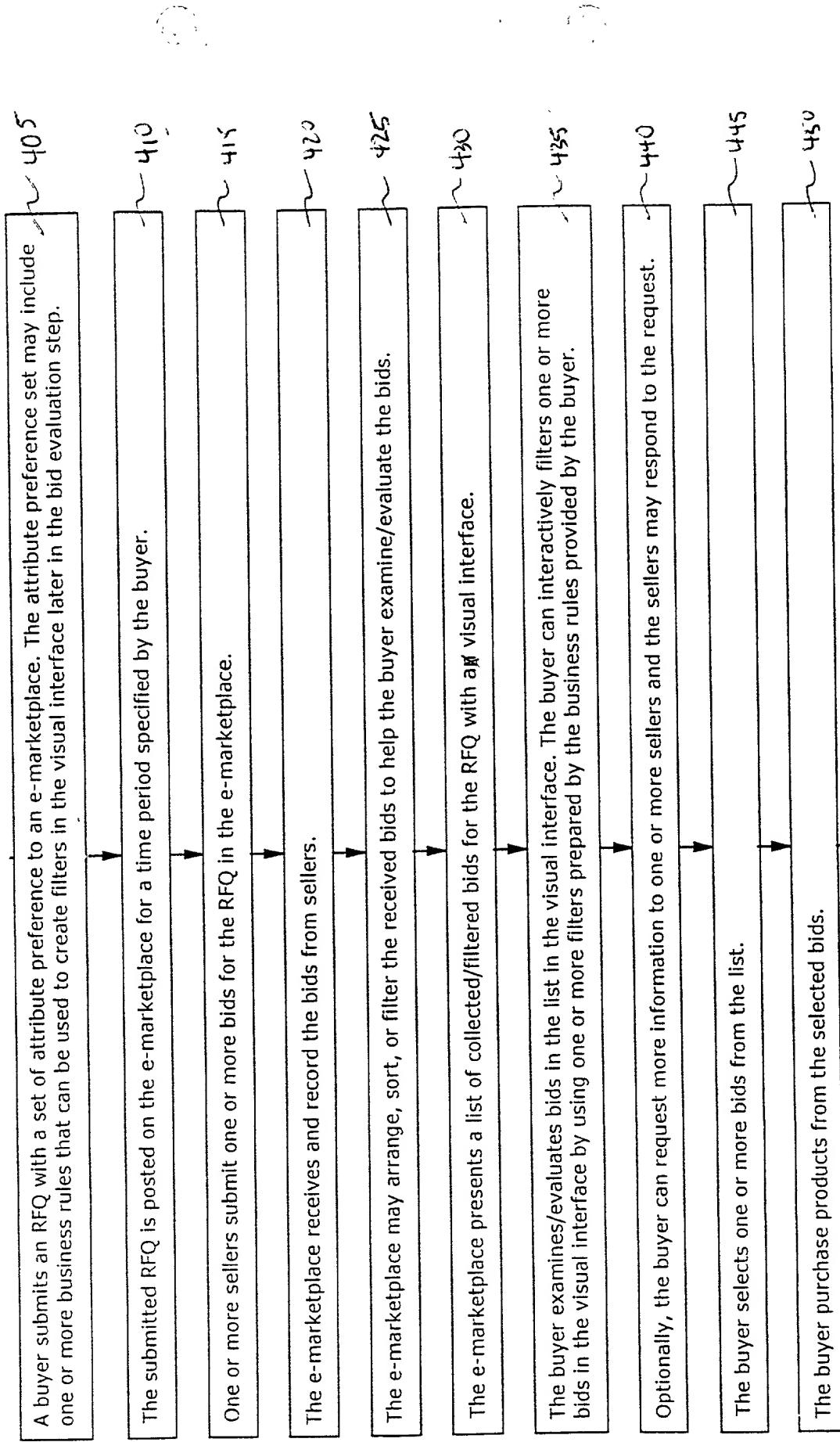


Figure: 1

500

RFQ number: 1097

501

Non-dominated bids only  510

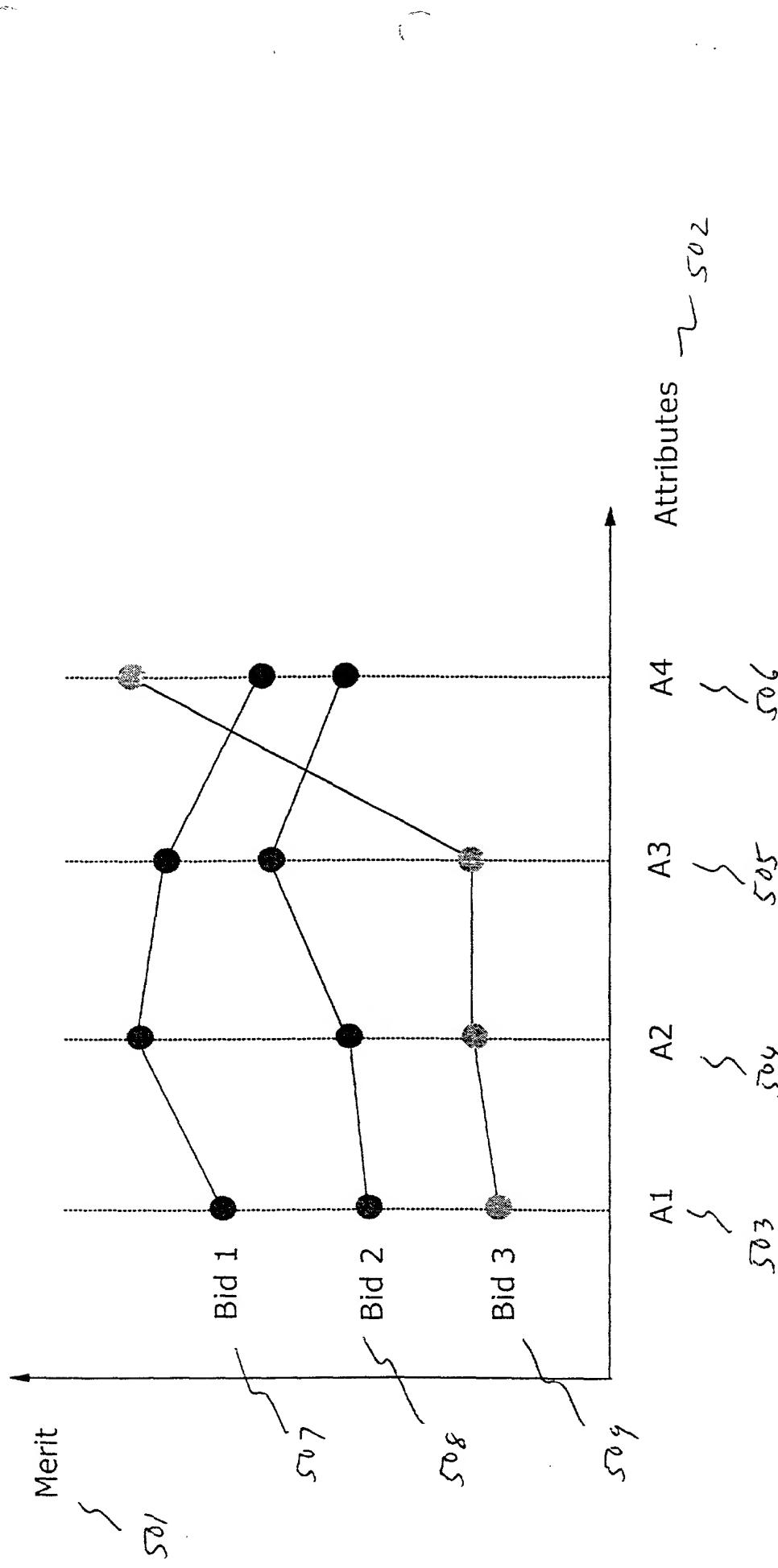


Figure: 5

600

RFQ number: 1097

Non-dominated bids only  ~ 510

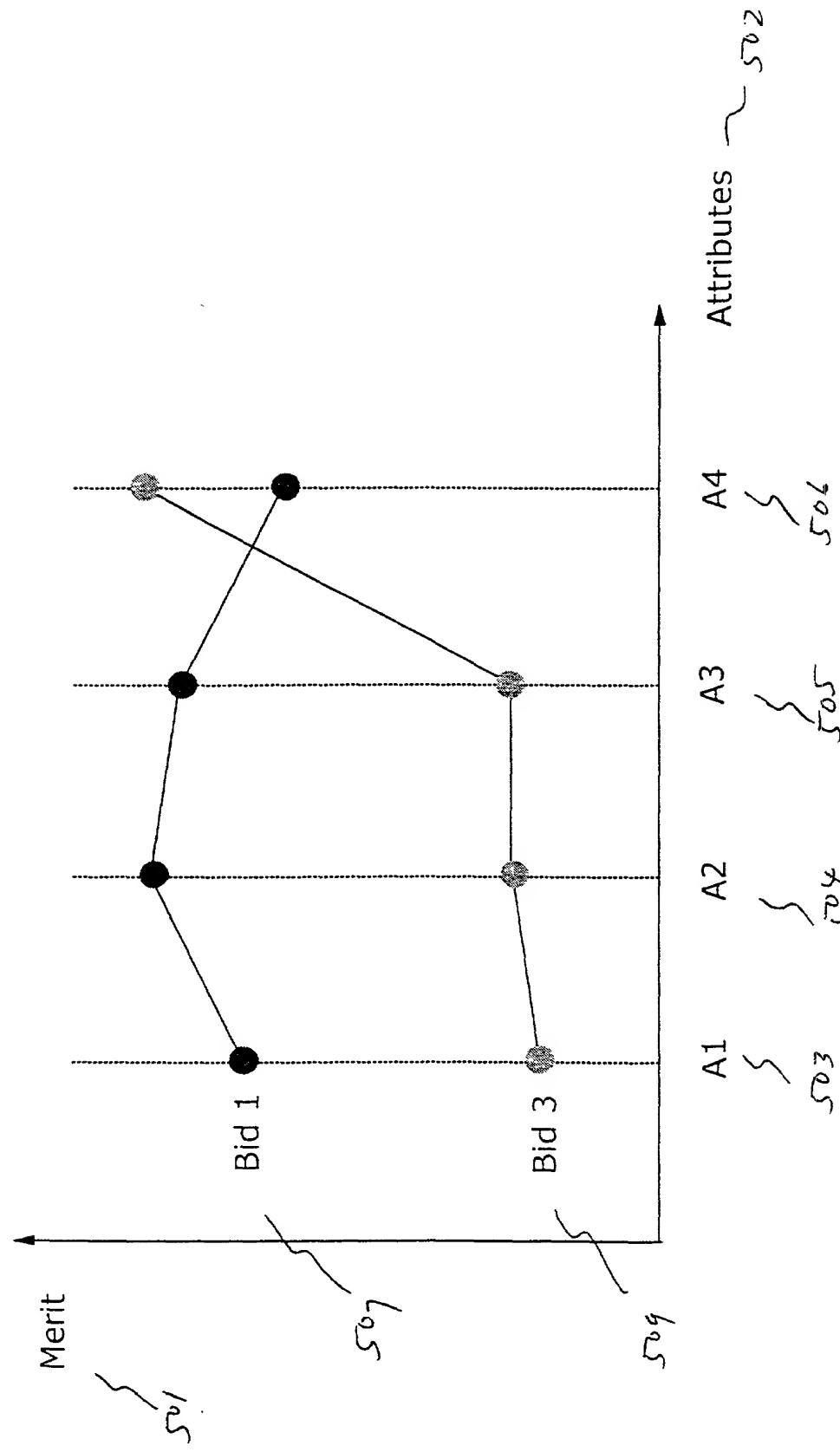


Figure: 6

700

RFQ number: 1097  
Date: 10/10/2011  
Time: 10:22:00

Non-dominated bids only

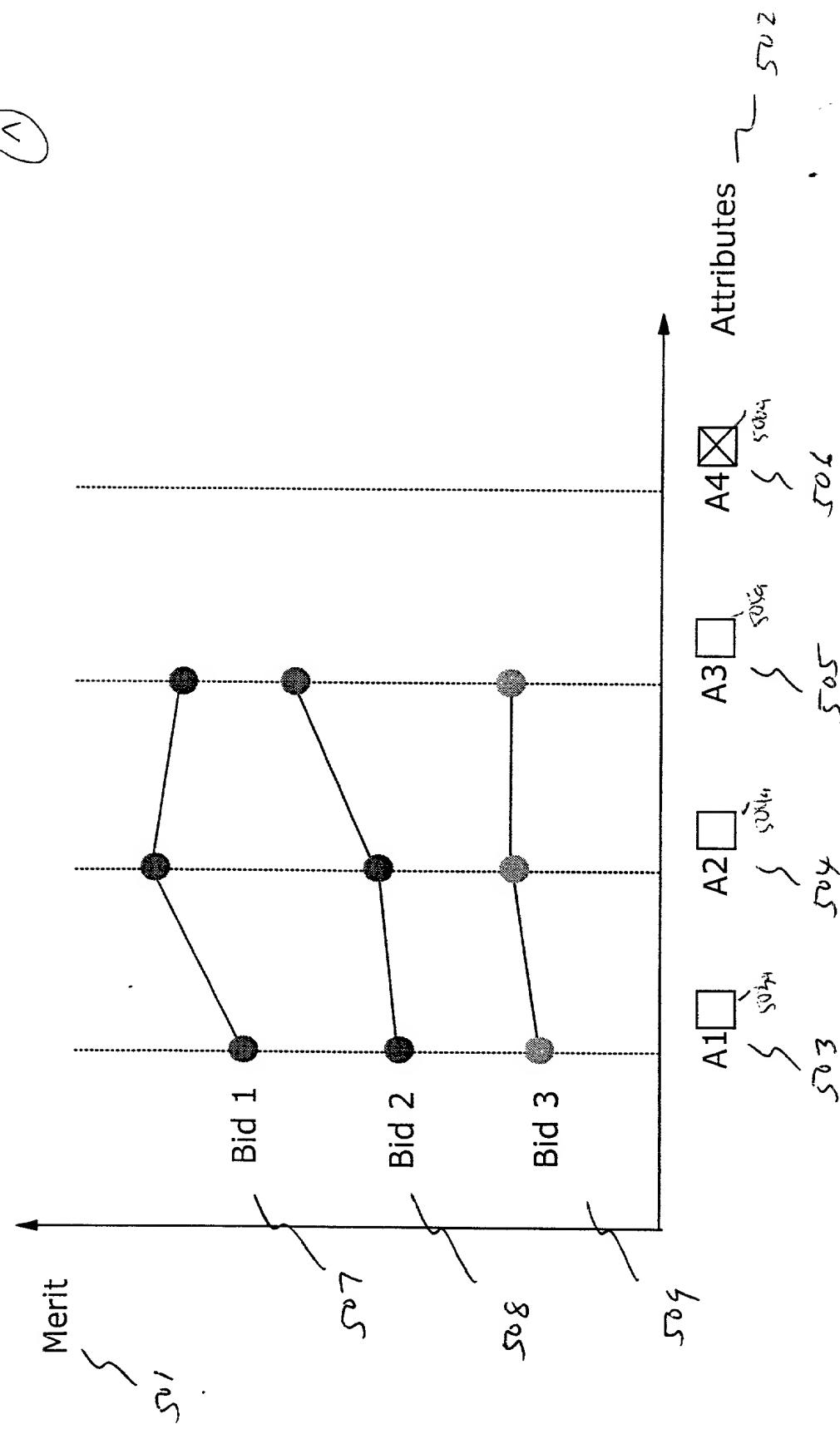


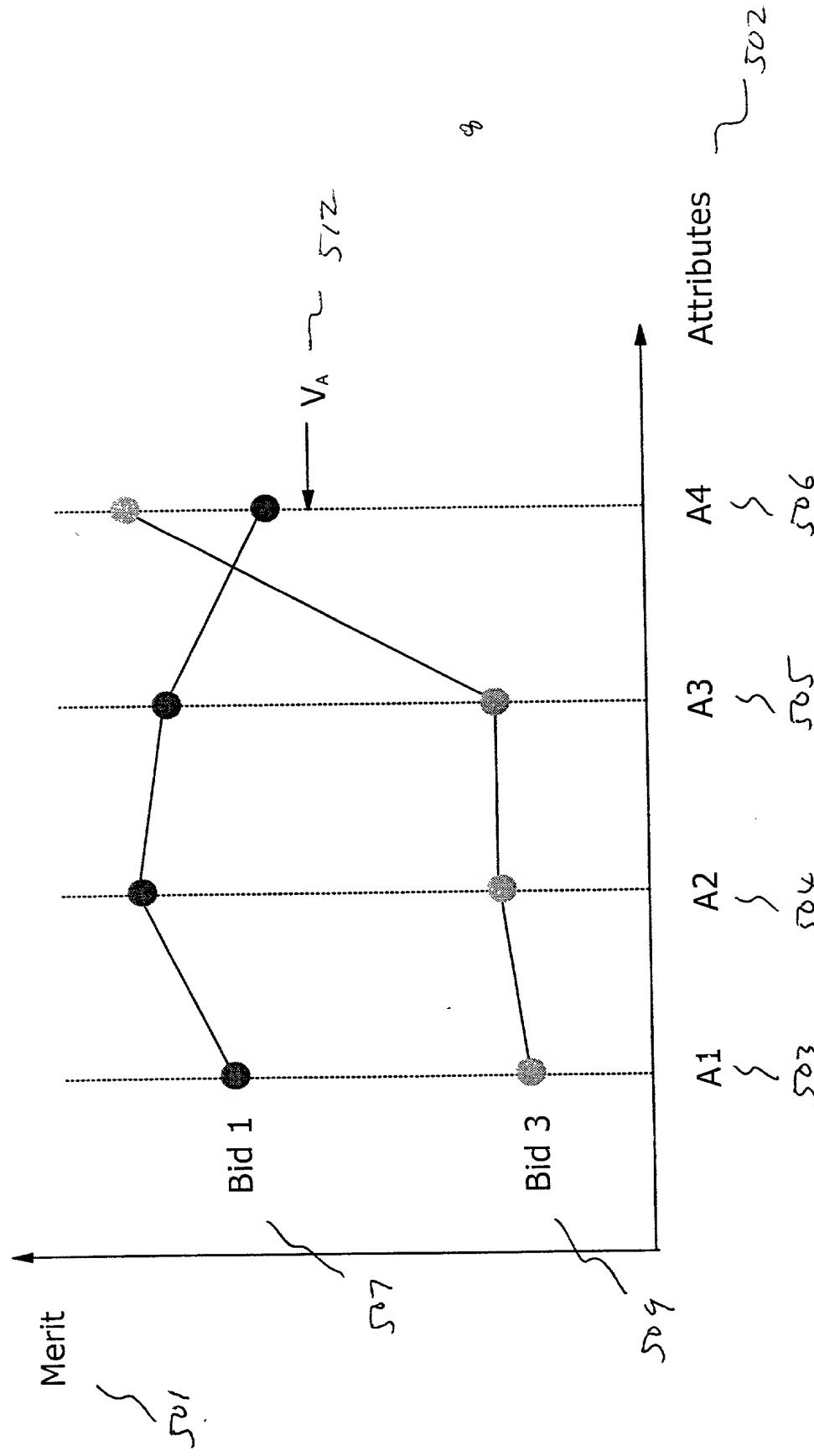
Figure: ?

800

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RFQ number: 1097

Non-dominated bids only   Value (A4) > V<sub>A</sub> only



**Figure:** 8

Docket No.: YOR9-2000-0713US1

**Application for United States Patent  
Declaration and Power of Attorney**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHOD AND VISUAL INTERFACE FOR EVALUATING MULTI-ATTRIBUTE BIDS IN A NETWORK ENVIRONMENT** the specification of which:

(check one)

is attached hereto

was filed on \_\_\_\_\_ as  
Application Serial No. \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).\*

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	yes	no

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
--------------------------	---------------	----------------------------------------

Power of Attorney: As a named inventor, I hereby appoint Manny W. Schecter, Reg. No. 31,722, Terry J. Ilardi, Reg. No. 29,936, Stephen C. Kaufman, Reg. No. 29,551, Louis J. Percello, Reg. No. 33,206, Jay P. Sbrollini, Reg. No. 36,266, Robert M. Trepp, Reg. No. 25,933, Daniel P. Morris, Reg. No. 32,053, Wayne L. Ellenbogen, Reg. No. 43,602, Douglas W. Cameron, Reg. No. 31,596, David M. Shoff, Reg. No. 39,835, Christopher A. Hughes, Reg. No. 26,914, Edward A. Pennington, Reg. No. 32,588, John E. Hoel, Reg. No. 26,279, Joseph C. Redmond, Jr., Reg. No 18,753, C. Lamont Whitham, Reg. No. 22,424, Marshall M. Curtis, Reg. No. 33,138, and Michael E. Whitham, Reg. No. 32,635, as attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. All correspondence should be directed to McGuireWoods, LLP, 1750 Tysons Boulevard, Suite 1800, Tysons Corner, McLean, Virginia 22102-3915. Phone calls should be directed to McGuireWoods, LLP, at 703-712-5000.

Docket No.: YOR9-2000-0713US1

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Date: 11/22/2000Date: 11/22/2000

\*Title 37, Code of Federal Regulations, §1.56(a):

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the inventor, on each attorney or agent who prepares or prosecutes the application and on every other individual who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they are aware of which is material to the examination of the application. Such information is material where there is substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and (1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability; or (2) it refutes, or is inconsistent with, a position the applicant takes in: (i) opposing an argument of unpatentability relied on by the Office, or (ii) asserting an argument of patentability.